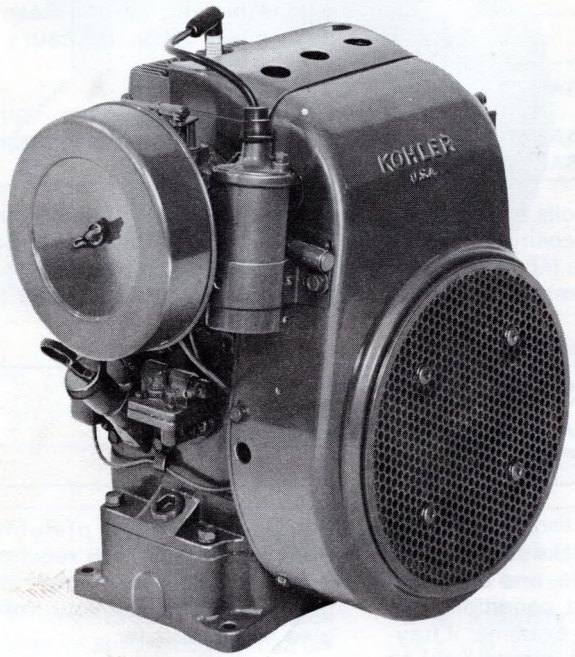
KOHLER engines

OWNER'S MANUAL



MODELS

K241 (10 hp) K301 (12 hp)

K321 (14 hp) & K341 (16 hp)

operating & maintenance instructions

INTRODUCTION

Powering your equipment is a dependable Kohler single cylinder engine. Your Owner's Manual will provide you with a simple and understandable guide for engine operation and maintenance. To keep your engine in top running condition, follow the maintenance procedures given in this manual.

Major repair information is provided in the Kohler Single Cylinder Service Manual, available from your Kohler Engine Service Dealer. However, major repair generally requires the attention of a trained mechanic and the use of special tools and equipment. Your Kohler Engine Service Dealer has the facilities, training and genuine replacement parts necessary to properly perform this service.

WARNING: *Before servicing engine or equipment, always remove the spark plug lead to prevent engine from starting accidentally. Ground the lead to prevent sparks that could cause fires.*

PRE-START INSTRUCTIONS

FUEL

Use clean, fresh, no-lead gasoline with pump sticker octane rating of 87 or higher in the U.S.A. In Canada and other countries using the research method it should be 90 octane minimum.

No-lead fuel leaves less combustion chamber deposits; however, leaded gasoline may be used if no-lead is unavailable.

Purchase gasoline in small quantities. Fresh gasoline reduces chance of gum deposits forming and clogging the fuel system and ensures a fuel blended for the season.

Do not add oil to the gasoline.

Do not use gasoline left over from the previous season.

WARNING: *Gasoline is extremely flammable and its vapors can explode if ignited. Store gasoline only in approved containers, in unoccupied buildings, away from spark or flames. Do not add gasoline while engine is running. Do not start or operate engine around spilled fuel. Never use gasoline as a cleaning agent.*

LUBRICATION

The importance of checking and changing crankcase oil cannot be overemphasized. Dirty oil causes premature engine wear and failure.

Before checking oil level, clean area around dipstick and oil fill areas to prevent dirt from entering into engine.

Oil should always be checked while engine is level.

With threaded plug-type dipstick, remove and wipe oil off—reinsert, but do not turn plug in. To check oil level, *shoulder* plug on top of hole. After checking, again turn plug all the way into crankcase.

With extended oil fill tube and dipstick, push dipstick all the way down in tube then take reading.

Check oil before each use when the engine is cool and the oil has drained back into the pan. Add oil if necessary to bring oil level up to, but not over, the "F" mark on the dipstick.

CAUTION: Do not operate engine with oil level below "L" mark or over the "F" mark.

Also read Oil Change under Maintenance Instructions.

Oil Type

Use oil meeting the requirements of SAE service class SC, SD, SE, or SF. Select oil viscosity based on the air temperature at the time of operation, as shown.

Air Temperature	Oil Viscosity
Above 32° F (0° C)	SAE-30
Below 32° F (0° C)	SAE 5W-20 or SAE 5W-30

Use straight weight oils as specified. Do not use multi-viscosity oils above 32°F as considerable increases in oil consumption and combustion deposits will result.

PRE-START CHECKLIST

With engine level:

Check oil. Add oil if required to bring level up to but not over the "F" mark.

Check fuel. Fill if required but do not overfill. Leave some room for fuel to expand.

Check air intake screen and cooling fins—make sure they are clean and unobstructed. If debris builds up on screen during engine operation, STOP engine immediately and clean off. An obstructed screen can cause engine overheating.

Check that all shrouds, equipment covers and guards are in place.

NOTE: Check your local laws and statutes regarding engine spark arrestor muffler requirements. See your Kohler Engine Service Dealer for optional spark arrestor muffler parts, if required.

OPERATING INSTRUCTIONS

ALSO READ THE OPERATING INSTRUCTIONS OF THE EQUIPMENT THIS ENGINE POWERS

STARTING

Kohler single cylinder engines are used in a wide variety of applications. Refer to the equipment manufacturer's instructions for exact starting procedure.

If engine is equipped with a clutch, make sure it is disengaged before starting, and if equipped with a transmission, make sure it is in neutral before starting.

Be especially careful on equipment with hydro-static drive. Shift lever must be exactly in NEUTRAL position. If the shift lever is not in NEUTRAL position, resistance will be placed on the normal rotation of the engine and prevent it from starting.

Move the throttle control lever to IDLE (slow) position.

For engines without automatic choke, move choke lever into full choke position and gradually return to OFF position after engine starts and warms up.

Manual Start

Pull starter handle straight out to avoid excessive wear from starter rope guide. A smooth steady pull will start engine.

While retractable starters do not require servicing, they should be checked occasionally to make sure they are secure on the engine, and also, that the rope is in good condition. Pull starter rope out and examine; if frayed, have it replaced immediately by your Kohler Engine Service Dealer.

Electric Start

Activate starter switch. As soon as engine starts, release switch.

Do not crank engine continuously for more than 10 seconds at a time.

A 60 second cool-down period must be allowed between cranking attempts if the engine does not start. Failure to follow these guidelines may result in burn-out of the starter motor.

CAUTION: In the event of "false start", that is, if the engine develops sufficient speed to disengage the starter, but fails to continue running, the engine must be allowed to come to a complete halt before a restart attempt is made. If the starter is engaged while the flywheel is still rotating, the starter pinion and flywheel ring gear may clash.

If starter motor will not turn the engine over, shut off starter motor immediately and make no further attempt to start engine until the condition is corrected.

Starter motors are prelubricated. Brushes normally will require attention only after extended use. For trouble analysis see your Kohler Engine Service Dealer.

If battery charge is not sufficient to turn starter motor over, recharge the battery. Do not attempt to jump start the engine with another battery—batteries larger than those recommended can cause starter motor burn-out.

Also read Battery Charging under Maintenance Instructions.

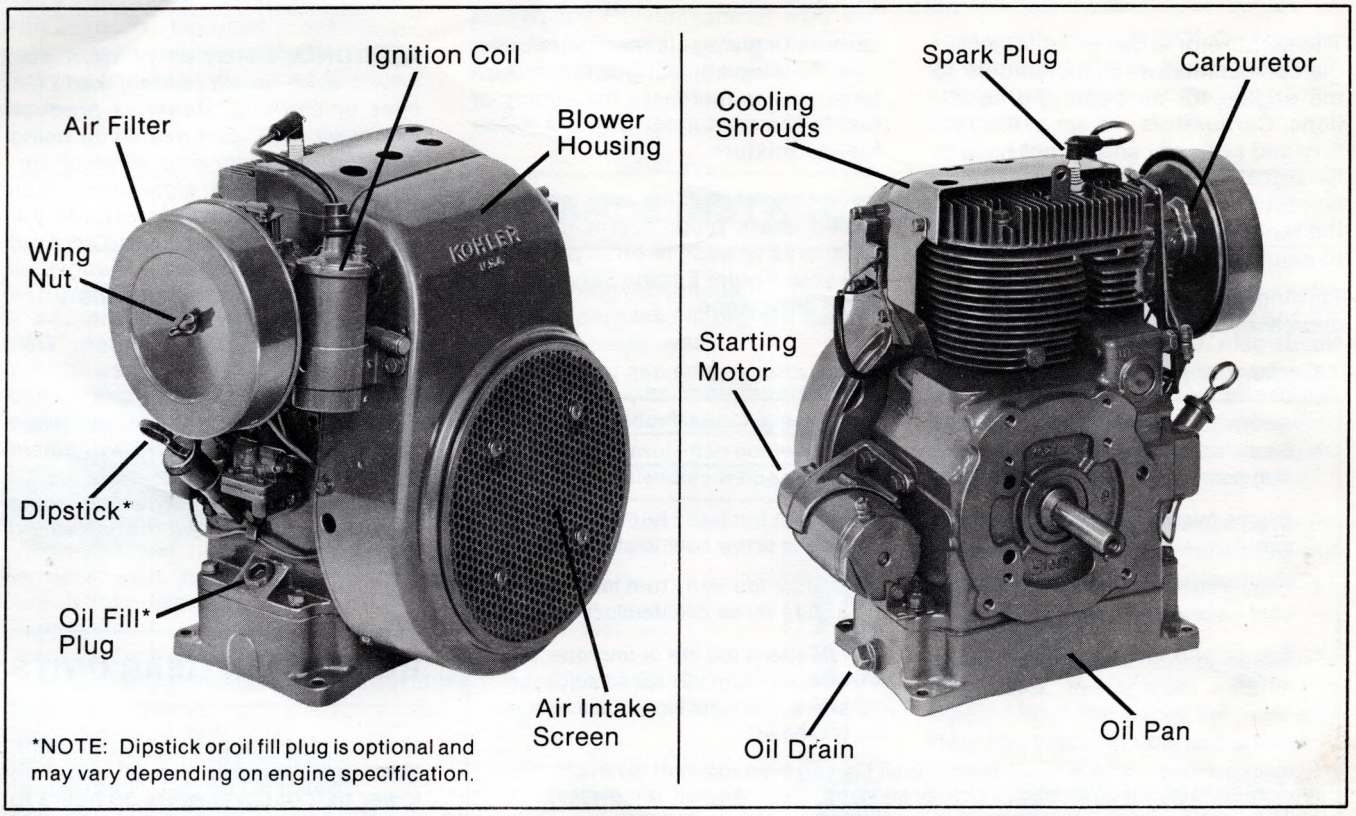
OPERATING

CAUTION: Do not operate engine continuously at an angle exceeding 30° in any direction as engine damage may result from lack of sufficient lubrication.

Also consult your equipment owner's manual which may have more stringent guidelines as to angle of operation due to equipment design.

WARNING: *Engine exhaust gases contain poisonous carbon monoxide. Avoid inhaling exhaust fumes and never run the engine in a closed building or confined area.*

ENGINE IDENTIFICATION



*NOTE: Dipstick or oil fill plug is optional and may vary depending on engine specification.

TROUBLESHOOTING

Do not attempt to service or replace major items or any items that call for special timing or adjustment procedures (governor, breaker points, etc.) - have this work done by a Kohler engine specialist.

When a problem occurs, do not overlook the simple causes. A starting problem could be caused by an empty fuel tank. The chart below lists some common causes of troubles.

Problem	No Fuel	Improper Fuel	Dirt In Fuel Line	Dirty Air Screen	Incorrect Oil Level	Engine Over-Loaded	Dirty Filter Element	Faulty Spark Plug
Will not start	X		X			X	X	X
Hard starting	X	X	X			X	X	X
Stops suddenly	X		X	X	X	X	X	
Lacks power		X	X	X	X	X	X	X
Operates erratically		X	X	X		X	X	X
Knocks or pings		X		X		X		X
Skips or misfires		X	X	X			X	X
Backfires			X			X	X	X
Overheats			X	X	X	X	X	
High fuel consumption							X	X

MODEL DESIGNATION

Model K241A for example, indicates the approximate cubic inch displacement (24), and the number of cylinders (1). Letter suffixes following the model number (A) designate a specific version as follows:

Suffix	Designates
A	oil pan type
EP	generator set
P	pump model
Q	quiet model
R	gear reduction
S	electric start
T	retractable start

YELLOW PAGES

For your nearest Kohler Engine Service Dealer, check the Yellow Pages under ENGINES, GASOLINE.

WARNING: *The engine and the exhaust system get extremely hot from operation. Do not operate equipment with shrouds, equipment covers or guards removed. Keep hands, feet, clothing and hair away from all moving parts.*

Do not allow equipment to run unattended.

WARNING: *Do not tamper with the governor setting—overspeed is hazardous and could void warranty.*

STOPPING

Turn ignition switch OFF. On engines so equipped, press and hold STOP button until engine comes to a complete stop.

MAINTENANCE INSTRUCTIONS

WARNING: *Before servicing engine or equipment, always remove the spark plug lead to prevent engine from starting accidentally. Ground the spark plug lead to prevent sparks that could cause fires.*

NOTE: If engine is operated under dirty, dusty conditions, maintenance procedures should be performed more frequently than stated.

MAINTENANCE PROCEDURES	FREQUENCY
Clean Air Intake Screen	DAILY
Check Oil Level	DAILY
Replenish Fuel Supply	DAILY
Service Precleaner	25 Hrs.
Change Oil	25 Hrs.
Check Reduction Gear Unit	50 Hrs.
Clean Cooling Fins and External Surfaces	50 Hrs.
Check Air Filter	50 Hrs.
Check Spark Plug	100 Hrs.
Have Breaker Points Checked*	500 Hrs.
Have Ignition Timing Checked*	500 Hrs.
Have Valve and Tappet Clearance Checked*	500 Hrs.
Have Cylinder Heads Serviced*-Constant Load & Speed	500 Hrs.•
Have Cylinder Heads Serviced*-Variable Load & Speed	1000 Hrs.••

*Have these services done only by a Kohler engine specialist.
•250 hours when leaded gasoline is used.
••500 hours when leaded gasoline is used.

OIL CHANGE

On a new engine, change oil after the first 5 hours of operation and then every 25 operating hours thereafter. Change oil more frequently under dirty, dusty conditions.

Drain oil while engine is still warm from operation and it flows freely, carrying away more impurities. (See Engine Identification illustration for location of drain plug.) After draining oil, reinstall drain plug. Select proper viscosity oil, and fill to "F" mark on dipstick as opposed to adding a given quantity of oil. Always check level on dipstick before adding more oil.

Engine must be level when checking or changing oil.

COOLING SYSTEM

Make sure the air intake screen is clean and unobstructed. If debris builds up on screen during engine operation, STOP engine immediately and clean off. An obstructed screen can cause engine overheating.

Every 50 operating hours (more often if conditions require) remove cooling shrouds and clean cooling fins. Also clean external surfaces of your engine of dust, dirt and oil which can contribute to improper cooling. Do not operate engine with cooling shrouds removed—this will cause overheating and engine damage.

AIR FILTER

This engine is equipped with a dry-type air filter element. Inspect air filter element every 50 operating hours and replace when dirty or damaged. Check more frequently under extremely dirty, dusty conditions.

Operating with a dirty air filter for only a brief period of time can ruin an engine.

Do not wash element or blow dirt off with compressed air, as this will puncture filter element. Replace when dirty or damaged with genuine Kohler filter element. Carefully handle new element—do not use if surfaces are damaged.

With air filter disassembled, check the base plate to make sure it is secure and not bent or damaged. Also check other air filter components such as the air filter cover, gaskets and tubes, if so equipped. Damaged components could allow unfiltered air into engine causing premature wear and failure.

Air filter cover wing nut must be finger tightened 1/2 to 1 full turn after nut contacts cover. Do not overtighten.

Precleaner

Some models are equipped with a precleaner. Precleaners extend the useful life of the paper air filter element by removing coarse particles.

Precleaners should be washed and oiled every 25 operating hours, or more often under extremely dirty, dusty conditions, as follows:

1. Remove precleaner from air filter element and wash in warm water with detergent.
2. Rinse thoroughly until all traces of detergent are eliminated and squeeze away excess water. Air dry. (Do not wring precleaner.)
3. Soak in fresh, clean engine oil and squeeze out excess oil.
4. Reinstall precleaner over air filter element.

SPARK PLUG

Clean area around spark plug before removing to prevent dirt from entering engine. Every 100 operating hours remove plug, check condition and reset gap to 0.035 in. (0.90 mm) or replace plug—see Specifications.

Carefully note spark plug appearance—it can indicate ignition trouble. If heavy black, or blistered white, deposits are noted, see your Kohler Engine Service Dealer for analysis. An incorrect spark plug, cracked porcelain, or improper spark gap can cause the engine to misfire.

Torque plug to 18-22 ft. lbs. (24-30 Nm) (2.5-3.0 kgm).

CARBURETOR

The carburetor is designed to deliver the correct mixture of fuel and air to the engine for all operating conditions. Carburetors are set at the factory and normally should not have to be adjusted. If your engine exhibits conditions similar to those found in the table below, it may be necessary to adjust your carburetor.

Turning adjusting screws clockwise decreases the supply of fuel to the carburetor giving a leaner fuel-air mixture. Turning adjusting screws counterclockwise increases the supply of fuel to the carburetor giving a richer fuel-air mixture.

An incorrect setting can lead to a fouled spark plug, overheating, excessive valve wear, or other problems. See your Kohler Engine Service Dealer for assistance.

Carburetor adjustments should be made only after engine has warmed up.

Condition	Possible Cause/Probable Remedy
1. Black, sooty exhaust smoke*, engine sluggish.	1. Mixture too rich - turn main fuel adjusting screw clockwise.
2. Engine misses and backfires at high speed.	2. Mixture too lean - turn main fuel adjusting screw counterclockwise.
3. Engine starts, sputters and stops under cold weather starting.	3. Mixture too lean - turn main fuel adjusting screw counterclockwise.
4. Engine runs rough or stalls at idle speed.	4. Idle speed too low or improper idle mixture - turn idle speed adjusting screw, then idle fuel adjusting screw if needed.

*If black exhaust smoke is noted, check the air filter first - an apparent "overrich" mixture can actually be a clogged air filter element. If, after element is replaced, black smoke or other problems continue, adjust carburetor immediately.

To Adjust Carburetor:

1. Stop engine, turn main fuel and idle fuel adjusting screws clockwise, until they bottom *lightly*.

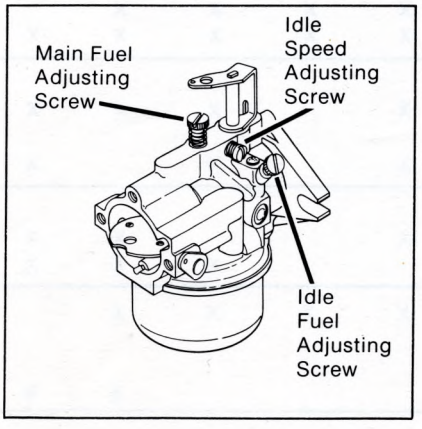
   CAUTION: Damage to main fuel and idle fuel adjusting screws will result if they are turned in forcefully. Adjusting screws are screw-type needle valves which taper to critical dimensions.

2. **Preliminary Setting - Main Fuel -** For models K241 and K301 - turn main fuel adjusting screw counterclockwise 1-1/2 turns from bottom. For models K321 and K341 -turn main fuel adjusting screw counterclockwise 2-1/2 turns from bottom. **Idle Fuel** - For all models -turn idle fuel adjusting screw counterclockwise 2-1/2 turns from bottom.

3. **Final Setting - Main Fuel** - For all models - start engine and run at maximum governed no-load speed, let warm up for 5-10 minutes. Turn main fuel adjusting screw clockwise from the preliminary setting until speed decreases and note position of the adjusting screw. Now turn adjusting screw counterclockwise—the engine speed may first increase, then it will decrease as the adjusting screw is turned. Note the position of the adjusting screw when engine speed starts to decrease. Set the adjusting screw midway between the two points noted.

4. **Final Setting - Idle Fuel** - For all models - run engine at maximum governed no-load speed, let engine warm up for 5-10 minutes. Allow engine speed to fall to idle, or put throttle into idle position. Make adjustment using the same procedure as Final Setting - Main Fuel (Step 3).

5. **Idle Speed Setting** - run engine at maximum governed no-load speed for 5-10 minutes, allow engine speed to fall to idle, or put throttle into idle position. Set engine speed to 1200 RPM (± 75 RPM) by turning the idle speed adjusting screw clockwise or counterclockwise.



BATTERY CHARGING

WARNING: *Batteries contain sulphuric acid—avoid contact with skin, eyes or clothing. Batteries produce explosive hydrogen gas when being charged. Ventilate area when charging battery. Keep cigarettes, open flame and sparks away from battery at all times. Keep batteries and acid out of the reach of children. Remove all jewelry when working on battery.*

Do not leave ignition switch "ON" when charging battery—a switch left "ON" can cause the ignition coil to overheat and possibly burst. When removing the battery from equipment always disconnect the negative (-) (ground) cable first. When replacing battery connect the negative (-) (ground) cable last.

REDUCTION GEAR UNITS

On engines equipped with a reduction gear unit, remove the oil plug on lower part of cover every 50 hours to check oil level. With the engine level, the oil level of the unit should be up to the bottom of the oil plug hole. To add oil, remove the vented plug at the top of the unit. Use the same weight and grade of oil as used in the engine crankcase.

STORAGE

If the engine is to be out of service for approximately two months or more, use the following storage procedure:

Drain oil from crankcase while engine is still warm from operation. Refill engine to "F" mark on dipstick with proper viscosity oil.

Drain reduction gear unit and refill with same oil as used in engine.

Drain fuel tank and carburetor (or run engine until tank is empty).

Remove spark plug and add a tablespoon of engine oil into the spark plug hole. Install plug, but do not connect plug lead. Crank engine 2 to 3 revolutions.

Clean exterior surfaces of engine.

Spread a light film of oil over any exposed metal surfaces of engine to prevent rust.

Store in a clean, dry place.

SPECIFICATIONS

K241
Power Rating at 3600 RPM .... 10 hp (7.5 kW)
Displacement .... 23.9 in³ (391 cm³)
Bore..... 3.25 in (82.6 mm)
Stroke ..... 2.88 in (73.0 mm)
Approx. Weight .... 118 lb. (53.5 kg)
Oil Capacity .... 4 U.S. pints (1.9 L)
Spark Plug Gap
Magneto Ignition ..... 0.025 in (0.65 mm)
Battery, Breakerless ..... 0.035 in. (0.90 mm)
Gaseous Fueled Engines ..... 0.018 in. (0.45 mm)
Spark Plug Size ..... 14 mm
Spark Plug Type ..... Champion RH-10 or equivalent
Breaker Point Gap (Nominal)..... 0.020 in. (0.50 mm)

K301
Power Rating at 3600 RPM .... 12 hp (9.0 kW)
Displacement .... 29.1 in³ (476 cm³)
Bore..... 3.38 in (85.7 mm)
Stroke ..... 3.25 in (82.6 mm)
Approx. Weight .... 118 lb. (53.5 kg)
Oil Capacity .... 4 U.S. pints (1.9 L)
Spark Plug Gap
Magneto Ignition ..... 0.025 in (0.65 mm)
Battery, Breakerless ..... 0.035 in. (0.90 mm)
Gaseous Fueled Engines ..... 0.018 in. (0.45 mm)
Spark Plug Size ..... 14 mm
Spark Plug Type ..... Champion RH-10 or equivalent
Breaker Point Gap (Nominal)..... 0.020 in. (0.50 mm)

K321
Power Rating at 3600 RPM .... 14 hp (10.4 kW)
Displacement .... 31.3 in³ (512 cm³)
Bore..... 3.50 in (88.9 mm)
Stroke ..... 3.25 in (82.6 mm)
Approx. Weight .... 118 lb. (53.5 kg)
Oil Capacity .... 4 U.S. pints (1.9 L)
Spark Plug Gap
Magneto Ignition ..... 0.025 in (0.65 mm)
Battery, Breakerless ..... 0.035 in. (0.90 mm)
Gaseous Fueled Engines ..... 0.018 in. (0.45 mm)
Spark Plug Size ..... 14 mm
Spark Plug Type ..... Champion RH-10 or equivalent
Breaker Point Gap (Nominal)..... 0.020 in. (0.50 mm)

K341
Power Rating at 3600 RPM .... 16 hp (11.9 kW)
Displacement .... 35.9 in³ (588 cm³)
Bore..... 3.75 in (95.3 mm)
Stroke ..... 3.25 in (82.6 mm)
Approx. Weight .... 122 lb. (55.4 kg)
Oil Capacity .... 4 U.S. pints (1.9 L)
Spark Plug Gap
Magneto Ignition ..... 0.025 in (0.65 mm)
Battery, Breakerless ..... 0.035 in. (0.90 mm)
Gaseous Fueled Engines ..... 0.018 in. (0.45 mm)
Spark Plug Size ..... 14 mm
Spark Plug Type ..... Champion RH-10 or equivalent
Breaker Point Gap (Nominal)..... 0.020 in. (0.50 mm)

PARTS ORDERING

The engine SPECIFICATION, MODEL, and SERIAL numbers on the identification plates are required when ordering replacement parts from your Kohler Engine Service Dealer. Identification plates are located on the engine shrouding. Include letter suffixes if there are any.

Record your engine identification numbers on the identification plates below for future reference.

KOHLER engine
HP
Spec. no.
Model no.
Refer to owners manual for operation and maintenance instructions.
KOHLER COMPANY
KOHLER WISCONSIN USA

Serial No.

LIMITED 1 YEAR ENGINE WARRANTY

We warrant to the original consumer that each new engine sold by us will be free from manufacturing defects in materials or workmanship in normal service for a period of one (1) year from date of purchase, provided it is operated and maintained in accordance with Kohler Co.'s instructions and manuals.

Our obligation under this warranty is expressly limited, at our option, to the replacement or repair at Kohler Co., Kohler, Wisconsin, 53044, or at a service facility designated by us, of such part or parts as inspection shall disclose to have been defective.

EXCLUSIONS:
This warranty does not apply to defects caused by casualty or unreasonable use, including faulty repairs by others and failure to provide reasonable and necessary maintenance.

The following items are not covered by this warranty:

Engine accessories, such as fuel tanks, clutches, transmissions, power drive assemblies, and batteries, unless supplied or installed by Kohler Co. These are subject to the warranties, if any, of their manufacturers.

WE SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES OF ANY KIND, including but not limited to, labor costs or transportation charges in connection with the replacement or repair of defective parts.

ANY IMPLIED OR STATUTORY WARRANTIES, INCLUDING WARRANTY OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY. We make no other express warranty, nor is anyone authorized to make any in our behalf.

Some states do not allow limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

TO OBTAIN WARRANTY SERVICE:
Purchaser must bring the engine to an authorized Kohler Service facility. For the facility nearest you, consult your Yellow Pages or write Kohler Co., Attn: Engine Warranty Service Dept., Kohler, Wisconsin 53044.

ENGINE DIVISION, KOHLER CO., KOHLER, WISCONSIN 53044

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